

**CRATE**  
**ACOUSTIC**

# CA6110D

## Acoustic Amplifier



**User's Guide**

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### Declaration Of Conformity

#33, Effective 01-01-2001

**Manufacturer's Name:** SLM Electronics  
**Production Facility:** 1901 Congressional Drive, St. Louis, MO 63146, USA  
**Production Facility:** 700 Hwy 202 W, Yellville, AR 72687, USA  
**Shipping Facility:** 1400 Ferguson Ave., St. Louis, MO 63133, USA  
**Office Facility:** 1400 Ferguson Ave., St. Louis, MO 63133, USA

**Product Type:** Audio Amplifier

**Complies with the following Standards:**

**Safety:** EN60065, E60065, C22.2, UL6500 and/or UL813  
**EMC:** Directive 89/336/EEC, EN55103, EN55013, EN61000, and/or FCC 47CFR 15B c1A

Supplementary information provided by:  
 SLM Electronics - R & D Engineering  
 1901 Congressional Drive, St. Louis, MO 63146, USA  
 Tel.: 314-569-0141, Fax: 314-569-0175

	<b>CAUTION</b> RISK OF ELECTRIC SHOCK DO NOT OPEN	
<small>WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE. TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</small>		

	<b>PRECAUCION</b> RIESGO DE CORRIENTAZO NO ABRA	
<small>PRECAUCION: PARA REDUCIR EL RIESGO DE INCENDIOS O DESCARGAS ELECTRICAS, NO PERMITA QUE ESTE APARATO QUEDA EXPUESTO A LA LLUVIA O LA HUMEDAD. PARA DISMINUIR EL RIESGO DE CORRIENTAZO, NO ABRA LA CUBIERTA. NO HAY PIEZAS ADETRON QUE EL USUARIO PUEDE REPARAR DEJE TODO MANTENIMIENTO A LOS TECNICOS CALIFICADOS.</small>		


	<b>ATTENTION</b> RISQUE D'ELECTROCUTION NE PAS OUVRIR	
<small>ATTENTION: PROTEGEZ CET APPAREIL DE LA PLUIE ET DE L'HUMIDITE AFIN D'EVITER TOUT RISQUE D'INCENDIE OU D'ELECTROCUTION. POUR REDUIRE D'ELECTROCUTION NE PAS ENLEVER LE COUVERCLE. AUCUNE PIECE INTERNE N'EST REPARABLE PAR L'UTILISATEUR. POUR TOUTE REPARATION, S'ADRESSEZ A UN TECHNICIEN QUALIFIE.</small>		


### IMPORTANT SAFETY INSTRUCTIONS

- READ, FOLLOW, HEED, AND KEEP ALL INSTRUCTIONS AND WARNINGS.
- DO NOT OPERATE NEAR ANY HEAT SOURCE AND DO NOT BLOCK ANY VENTILATION OPENINGS ON THIS APPARATUS. FOR PROPER OPERATION, THIS UNIT REQUIRES 3" (75CM) OF WELL VENTILATED SPACE AROUND HEATSINKS AND OTHER AIR FLOW PROVISIONS IN THE CABINET.
- DO NOT USE THIS APPARATUS NEAR SPLASHING, FALLING, SPRAYING, OR STANDING LIQUIDS.
- CLEAN ONLY WITH LINT-FREE DAMP CLOTH AND DO NOT USE CLEANING AGENTS.
- ONLY CONNECT POWER CORD TO A POLARIZED, SAFETY GROUNDED OUTLET WIRED TO CURRENT ELECTRICAL CODES AND COMPATIBLE WITH VOLTAGE, POWER, AND FREQUENCY REQUIREMENTS STATED ON THE REAR PANEL OF THE APPARATUS.
- PROTECT THE POWER CORD FROM DAMAGE DUE TO BEING WALKED ON, PINCHED, OR STRAINED.
- UNPLUG THE APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME.
- ONLY USE ATTACHMENTS, ACCESSORIES, STANDS, OR BRACKETS SPECIFIED BY THE MANUFACTURER FOR SAFE OPERATION AND TO AVOID INJURY.
- WARNING: TO REDUCE THE RISK OF ELECTRIC SHOCK OR FIRE, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.
- SERVICE MUST BE PERFORMED BY QUALIFIED PERSONNEL.
- OUR AMPLIFIERS ARE CAPABLE OF PRODUCING HIGH SOUND PRESSURE LEVELS. CONTINUED EXPOSURE TO HIGH SOUND PRESSURE LEVELS CAN CAUSE PERMANENT HEARING IMPAIRMENT OR LOSS. USER CAUTION IS ADVISED AND EAR PROTECTION IS RECOMMENDED IF UNIT IS OPERATED AT HIGH VOLUME.



EXPLANATION OF GRAPHICAL SYMBOLS:  
 EXPLICACION DE SIMBOLOS GRAFICOS:  
 EXPLICATION DES SYMBOLES GRAPHIQUES:

 = "DANGEROUS VOLTAGE"  
 "VOLTAJE PELIGROSO"  
 "DANGER HAUTE TENSION"

 = "IT IS NECESSARY FOR THE USER TO REFER TO THE INSTRUCTION MANUAL"  
 "ES NECESARIO QUE EL USUARIO SE REFIERA AL MANUAL DE INSTRUCCIONES."  
 "REFERREZ-VOUS AU MANUAL D'UTILISATION"

## About the Crate Acoustic CA6110D:

**D**esigned for the performing artist, Crate's *CA6110D Acoustic Amplifier* gives you **more** of what you want. More power. More clarity. More control. And, more freedom. Imagine: microphone quality sound, *without feedback*. And without being "chained" to a mic stand!

**More power:** a 60 watt RMS power amplifier drives a 10" polypropylene woofer for plenty of volume and low end punch.

**More clarity:** a high efficiency Piezo tweeter provides clean crisp highs and natural mid-range blend. A tweeter level control allows you to adjust the high frequency output to suit your taste.

**More control:** two separate channels, each with its own gain, tone, and reverb/effects controls. An automatic feedback elimination circuit with two filter select controls lets you kill feedback without sacrificing sound quality. The filters can be controlled by means of a footswitch provided with the unit.

A pair of CD Input jacks allows you to play along with a compact disc, cassette tape, or a rhythm machine.

**Still more:** Footswitch jacks on the rear panel provide control for the feedback circuit as well as two "tracking" DSP presets. Level-controllable XLR and 1/4" balanced line outs allow you to patch into house sound boards or recording consoles, plus an effects loop line-in/line-out setup allows connection of external effects. An external speaker jack lets you connect the amplifier to another separate speaker cabinet.

**Enough already?** Not for us. The *CA6110D* features Crate's *Digital Signal Processing (DSP)* for a variety of digital reverbs, effects and delays specifically designed for acoustic instruments.

The *CA6110D* was designed, evaluated, and tweaked by music loving engineers. Each amplifier is produced by skilled assemblers using sophisticated assembly machines and the finest components. Trained craftsmen assemble and cover every cabinet by hand. The finished product is tested – and played – by skilled musicians/technicians. It is only after the amplifier has passed this meticulous design/assembly/performance/approval process that we allow it to be shipped to our customers.

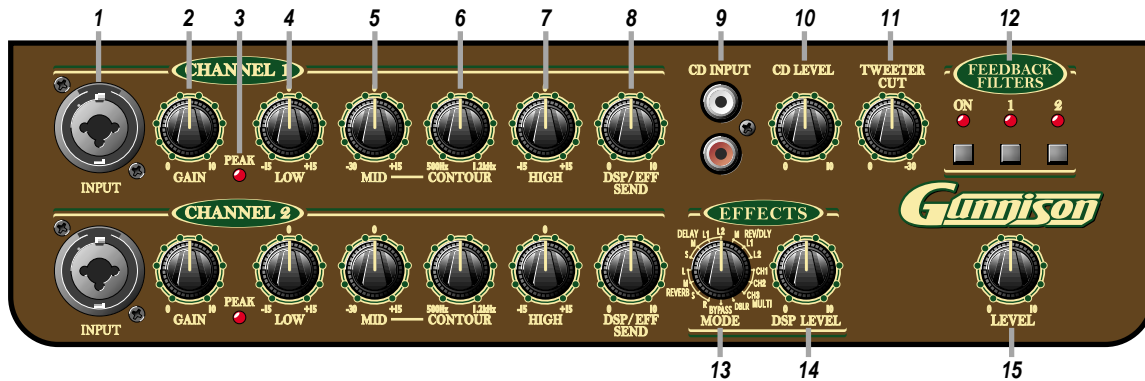
The *CA6110D Acoustic Amplifier*.  
Designed to be the best, so you can ***sound your best!***

To get this amplifier to sound its best, read this owner's guide prior to its use.

To keep this amplifier looking its best, avoid abrasive cleansers. Wipe the cabinet clean using a slightly dampened cloth. Never use brass cleaners on the hardware since they could damage their protective coatings.

*Crate Acoustic amplifiers are Made With Pride in the U.S.A.*

## The Front Panel:



**NOTE:** Channel 1 and Channel 2 are independent of each other up to the Effects and Master sections. The text below (#1-8) applies to both channels.

- 1: **Input.** The signal from a low impedance microphone or your acoustic instrument may be connected here by means of a shielded, balanced microphone cable terminated with an XLR connector or a shielded signal cable. This combo jack has 15 volts phantom power applied to XLR pins 2 and 3. (Mics not requiring phantom power will not be affected.)
- 2: **Gain.** This serves as the input level control for the Input jack (#1). For the best signal to noise ratio set this control so the Peak LED (#3) flashes on strong signals.
- 3: **Peak.** This LED flashes when the signal level into the preamp approaches clipping. Adjust the Gain control (#2) until a strong signal causes this LED to flash.
- 4: **Low.** This serves as the bass control. Adjust this control to get the best sounding bass response for this channel. Excessive boost of the low control can cause an unnatural howling and should be avoided.
- 5: **Mid.** This serves as the midrange control. Adjust this control to get the best projection and midrange tones for your instrument. The center point of the mid control is chosen by the setting of the Contour control (#6).
- 6: **Contour.** Use this control to set the center point of the Mid control (#5). Set this control at the frequency which gives you the most natural-sounding midrange tones.
- 7: **High.** This serves as the treble control. Adjust this control so your high notes and harmonic overtones are lively but not overpowering.
- 8: **DSP/Eff Send.** Use this control to adjust the amount of internal Digital Effect and/or external effect (if used).

### The Master Section - part one:

- 9: **CD Input.** Use these RCA jacks to connect a CD or tape player to the amplifier. Use the CD Level control (#10) to adjust the level of the player.
- 10: **CD Level.** Use this control to adjust the signal level at the CD Input jacks (#9).
- 11: **Tweeter Cut.** Use this control to reduce the output level of the internal high frequency driver. In the fully counter-clockwise position, the tweeter is at its full output level. As you rotate the control clockwise, the tweeter level decreases. Adjust this control to best suit your playing environment.
- 12: **Feedback Filters.** Use these switches to activate the CA6110D's advanced feedback elimination circuitry. For complete details, see the section entitled "To Eliminate Feedback" on page 6.

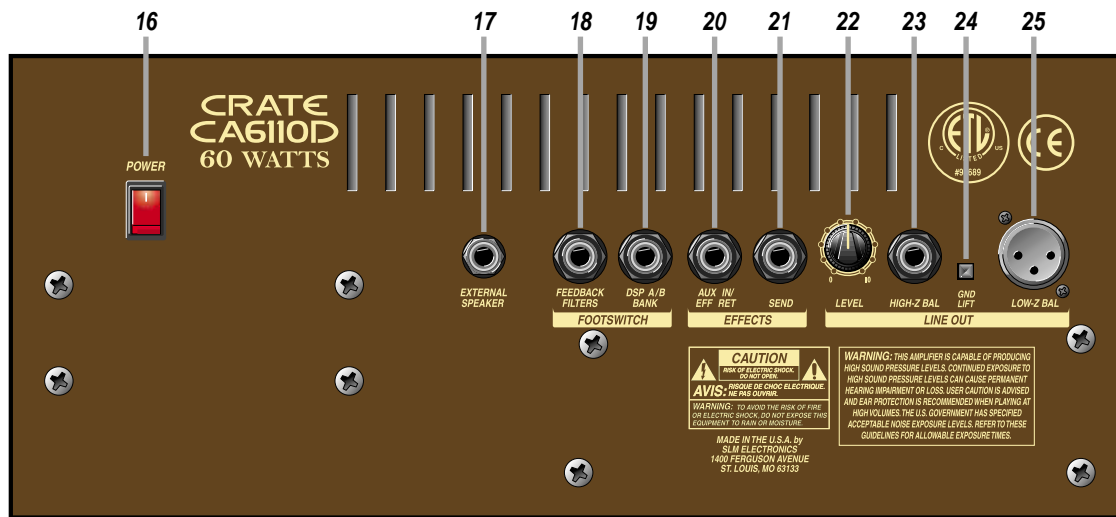
### The Effects Section:

- 13: **Mode.** Use this control to select the type of Digital Signal Processing effect applied to the output signal. For a listing of the effects, please see the section entitled "The DSP Section" on page 6.
- 14: **DSP Level.** Use this control to adjust the amount of internal DSP effect.

### The Master Section - part two:

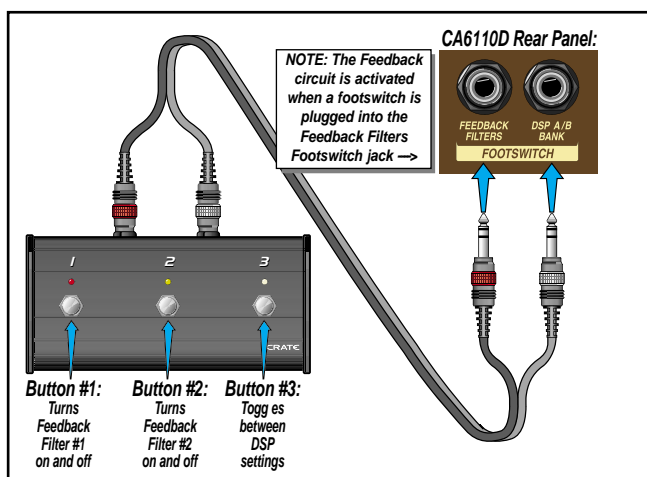
- 15: **Level.** Use this control to set the overall output level of the amplifier.

## The Rear Panel:



- 16: Power.** Use this switch to turn the amplifier on (top of the switch depressed) and off (bottom of the switch depressed.) The power switch illuminates when the amplifier is on.
- 17: External Speaker.** Use this jack to connect the amplifier to an external speaker cabinet. This jack is wired in series with the internal speakers which remain active when an external speaker is connected.
- 18: Feedback Filters Footswitch.** Connect the three-button footswitch to this jack for remote control of the feedback filters. The Feedback Filters ON LED (#12, front panel) illuminates and the feedback circuit is activated when a footswitch is connected to this jack. Footswitch button #1 controls Feedback Filter 1, button #2 controls Filter #2. (See illustration below.)  
**Note:** This is a STEREO jack: tip = Filter 1, ring = Filter 2, sleeve is ground. Use only a footswitch equipped with a *stereo* 1/4" plug.
- 19: DSP A/B Bank Footswitch.** Connect the three-button footswitch to this jack for remote control of *two* DSP settings:

1. With footswitch button #3's LED illuminated, select one of the DSP settings
  2. Step on footswitch button #3 - the LED will go out - select a different DSP setting
  3. Step on footswitch button #3 again - the LED illuminates, and the DSP automatically changes back to the setting chosen in step 1.
  4. Step on footswitch button #3 again - the LED goes out, and the DSP automatically changes back to the setting chosen in step 2.
- 20: Effects Aux In/Eff Ret.** When using an external signal processor or any line level signal (drum machine, keyboard, etc), connect the output of the device to this jack by means of a shielded signal cable.
- 21: Effects Send.** When using an external signal processor, connect this jack to the input of the effect by means of a shielded signal cable.
- 22: Line Out Level.** Use this control to adjust the output level of the line out signal. (This control works independently from the amplifier's master level control.)
- 23: High Z Bal Line Out.** Use this jack to connect a high impedance, line level signal to a house sound board, a recording console or an external power amplifier by means of an 1/4" stereo plug-terminated cable. (Ring is signal +, tip is signal -, and sleeve is ground.)
- 24: Gnd Lift.** This switch, when depressed, electronically disconnects both of the Line Out jacks' (#23, #25) chassis ground connections. If you experience excessive noise when using the Line Out jacks, depress this switch.
- 25: Low Z Bal Line Out.** Use this jack to connect a low impedance, line level signal to a house sound board, a recording console or an external power amplifier by means of an XLR-terminated cable. (Pin 1 is ground, pin 2 is signal +, and pin 3 is signal -.)
- 26: AC Line Cord (not shown).** The grounded power cord should only be plugged into a grounded power outlet that meets all applicable electrical codes and is compatible with the voltage, power and frequency requirements stated on the rear panel. **Do not attempt to defeat the safety ground connection!**



## To Eliminate Instrument Feedback:

One of the most common problems encountered when amplifying acoustic instruments, especially in small environments, is feedback. Acoustic instruments typically have inherent qualities which cause resonant feedback at specific frequencies. Instrument tone controls and sound board equalizers are helpful in getting rid of the problem, but they typically operate around relatively wide frequency bands. This almost always means the musician must sacrifice sound quality in his quest to do away with feedback. But since Crate's feedback elimination circuit isolates only the offending frequency, instrument feedback from the CA6110D can be eliminated without affecting the overall sound.

If you experience feedback while playing, depress the Feedback Filters On switch. This activates the automatic feedback control circuit. Depress the Feedback Filter 1 switch to isolate and control the offending frequency. If feedback occurs again while the Filter 1 switch is depressed, depress the Filter 2 switch to isolate and control the second offending frequency.

The LEDs above the switches illuminate when the switches are depressed. When a footswitch is used in the Feedback Filters Footswitch jack (#18), the ON LED illuminates when the plug is inserted into the jack and the front panel switches are rendered inoperative.

## The DSP Section:

The CA6110D features Crate's On-Board *Digital Signal Processing (DSP)* technology that was designed specifically for use with acoustic instruments and vocals. This provides a large selection of digital reverbs, effects and delays. Select the type of effect desired by rotating the Mode control (#13). The effects are described below.

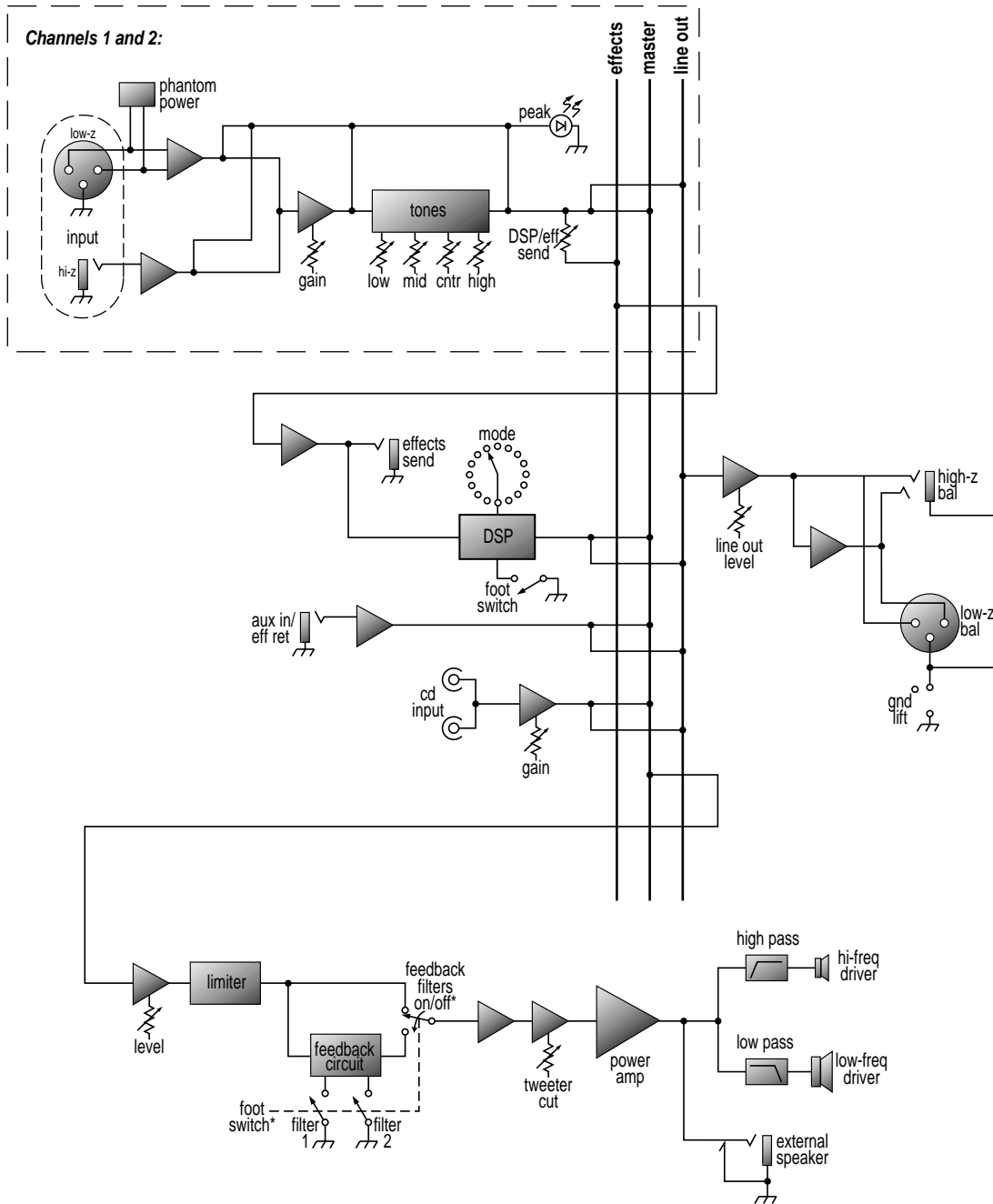
When a footswitch is used in the DSP A/B Back Footswitch jack (#19), a separate DSP setting can be stored and recalled for each of the footswitch's two button positions (LED on, LED off). Refer to the steps on page 5, item #19.



The following chart provides a list of the **DSP** settings along with a brief description of each effect.

- Reverb:**
  - R** average room reverb
  - S** small dark hall reverb
  - M** medium hall reverb
  - L** large hall reverb
- Delay:**
  - S** 100 milisecond delay
  - M** 200 milisecond delay
  - L1** 335 milisecond delay
  - L2** 500 milisecond delay
- Rev/Dly:**
  - M** reverb with 250 milisecond delay
  - L1** reverb with 400 milisecond delay
  - L2** reverb with 550 milisecond delay
- Multi:**
  - Ch1** chorus effect
  - Ch2** chorus, 375 milisecond delay, reverb
  - Ch3** 425 milisecond delay with chorus, reverb
  - Dblr** adds second signal slightly out of sync with original
  - Bypass** effects "off"

## System Block Diagram:



\*NOTE: Feedback circuit activated when footswitch plug is inserted into Feedback Filters Footswitch jack

## Technical Specifications:

<b>Output Power Rating:</b>	60 watts @ <1% THD
<b>Channels 1 &amp; 2: Low:</b>	+/-15dB @ 80Hz
<b>Mid:</b>	+15, -30dBdB from 450Hz – 1.2kHz (Contour)
<b>High:</b>	+/-15dB @ 10kHz
<b>Input Impedance:</b>	3.3M ohm High-Z, 3k ohm Low-Z
<b>Input Sensitivity:</b>	5mV High-Z, 2mV Low-Z
<b>Sens. to Eff Send/Line out:</b>	6mV High-Z, 3mV Low-Z
<b>Max Input Signal:</b>	6V RMS (17V peak to peak)
<b>CD Input: Input Impedance:</b>	22k ohm
<b>Input Sensitivity:</b>	150mV
<b>Max Input Signal:</b>	6V RMS (17V peak to peak)
<b>AuxEff. Return: Input Impedance:</b>	11k ohm
<b>Input Sensitivity:</b>	60mV RMS
<b>Max Input Signal:</b>	6V RMS (17V peak to peak)
<b>Eff Send Out. Impedance:</b>	2.2k ohm
<b>Line Out Out. Impedance:</b>	220 ohm Low-Z, 2.2k ohm High-Z
<b>Feedback Filters:</b>	10Hz to 4.8kHz range, -15dB cut per filter
<b>Internal Woofer:</b>	10" w/polypropylene cone, rubber surround, 30.5oz magnet, 1.5" voice coil, 8 ohms, 75w RMS, 95dB 1w 1m
<b>Internal Tweeter:</b>	High efficiency Piezo, 110dB 1w 1m
<b>Internal Crossover:</b>	Passive type
<b>Power Requirements:</b>	120VAC, 60Hz, 70VA 100/115VAC, 50/60Hz, 70VA 230VAC, 50/60Hz, 70VA
<b>Size and Weight:</b>	17"H x 16"W x 14"D, 37 lbs.

*Crate continually develops new products, as well as improves existing ones. For this reason, the specifications and information in this manual are subject to change without notice.*



[www.crateamps.com](http://www.crateamps.com)

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